Rationale for Louisiana's DRAFT 2006 Integrated Report
Meeting Requirements of Sections 303(d) and 305(b) of the Clean Water Act

Introduction

This rationale is submitted in support of Louisiana's 2006 Integrated Report (IR). The IR was developed in order to meet reporting requirements of the Federal Water Pollution Control Act (33 U.S.C. §1313 and 40 CFR Chapter 1 §130.7), commonly known as the Clean Water Act (CWA). Specifically, assessment results for this IR satisfy requirements of §303(d) and §305(b) of the CWA. Reports under §303(d) and §305(b) must be prepared every even numbered year. Following current EPA guidance, these two reports are now combined into one Integrated Report. This rationale includes descriptions of changes made to Louisiana's IR since the 2004 cycle, along with the reasoning behind those changes. Changes to the IR for 2006 are based on new ambient water quality data collected from 1 January 1998 to 23 September 2005. Not using data collected after 23 September 2005 removes possible water quality effects caused by Hurricanes Katrina and Rita. During the 2005 ambient monitoring rotation there was little ambient sampling in the area affected by Hurricane Katrina; therefore, the period from 29 August 2005 when Hurricane Katrina came ashore and 23 September 2005 when Hurricane Rita came ashore did not include any sampling from the area affected by Katrina. In addition, due to rapidly shifting priorities following Hurricane Katrina, little or no ambient monitoring was conducted statewide. Additional assessment changes are based on data collected at Louisiana's 21 long-term trend sites for water quality monitoring.

Section 303(d) of the CWA requires the identification, listing, and ranking for development of Total Maximum Daily Loads (TMDLs) for waters that do not meet applicable water quality standards after implementation of technology-based controls. Section 305(b) of the CWA requires, among other items, a description of all navigable waters in each State and the extent to which these waters provide for the protection and propagation of fish and wildlife, and allow for recreational activities in and on the water (33 U.S.C. §1315(b) et seq.) All assessments were prepared using existing and readily available water quality data and information in order to comply with rules and regulations under §303(d) of the Act (33 U.S.C. §1313 and 40 CFR Chapter 1 §130.7). Additional data and information is being solicited during the 30-day public comment period and will be considered when preparing the final 2006 IR for submittal to the U.S. Environmental Protection Agency (EPA). In most cases, water quality assessments and possible §303(d) listing are based on specific water body subsegments as defined in Louisiana's Environmental Regulatory Code (ERC) 33:IX.1123, Table 3 (ERC, 2006).

The 2006 IR contains new assessments for the Atchafalaya, Barataria, Calcasieu, Mississippi, Ouachita, and Terrebonne Basins of Louisiana, as well as water bodies for which long-term trend site data are available. Louisiana's water quality monitoring and assessment program follows the four-year rotating basin approach shown in Table 1. Water quality assessments for a given basin are done every other IR cycle after all subsegments in the basin have been monitored for a given rotation. Subsegments containing long-term trend sites continue to be assessed every IR cycle.

LDEQ's four-year rotation monitoring program has a number of benefits over the previous monitoring programs:

1. Water quality data from the same number of water bodies will be collected over a shorter period of time, thus improving LDEQ's ability to identify and target newly developing problems in a timely manner.
2. Samples will be collected statewide, instead of in two or three basins per year, enabling LDEQ to monitor water quality issues on a broader regional scale.
3. Regional staff responsible for collection of samples will remain skilled and up-to-date on the latest sampling procedures.
4. Regional staff will be able to balance their workload more evenly, instead of having two or three years in which they do little or no ambient water quality sampling and one year of intense field sampling at the expense of all other work.
5. Water body assessments can now be conducted on groups of six alternating basins during each IR cycle. Beginning with the 2006 IR cycle, this results in six basins being assessed in 2006, followed by the remaining six basins in 2008. The first six basins are then reassessed in 2010, and so on.

Table 1.
Monitoring and assessment schedule for Louisiana's four-year rotating basin plan.

Basin	Monitoring Years	Assessment Year
Atchafalaya	2004, 2005	2006
Barataria	2004, 2005	2006
Calcasieu	2004, 2005	2006
Mermentau	2004, 2005, 2006, 2007	2008
Mississippi	2004, 2005	2006
Ouachita	2004, 2005	2006
Pearl	2006, 2007	2008
Pontchartrain	2006, 2007	2008
Red	2004, 2005, 2006, 2007	2008
Sabine	2006, 2007	2008
Terrebonne	2004, 2005	2006
Vermilion/Teche	2004, 2005, 2006, 2007	2008

2006 Water Quality Assessment Procedures

General Assessment Procedures

Assessment procedures used for Louisiana's 2006 IR have been developed over a number of years for use in previous §305(b) reports. Procedures follow EPA guidance documents for §305(b) assessments, EPA's Consolidated Assessment and Listing Methodology (CALM) guidance, as well as Louisiana's surface water quality standards, and ERC 33:IX.1101-1123. Assessment procedures remain largely the same as were used for the 2004 IR. Deviations from previous procedures will be noted in the following description of assessment processes.

For the 2006 IR assessment, field staff collected monthly field analysis and laboratory samples. Laboratory samples were sent to LDEQ's water laboratory in Baton Rouge (conventional parameters), one of several Louisiana Department of Health and Hospitals (LDHH) laboratories (fecal coliforms), or a contract lab (metals). In order for water quality or other related data to be utilized for §305(b) Reporting and §303(d) listing, sample collection, handling, and laboratory analysis must be in accordance with LDEQ's Quality Assurance Project Plan developed by LDEQ and approved by EPA Region 6. Data from the LDEQ laboratory as well as field data were entered into LIMS (Laboratory Information Management System) by laboratory staff. After receiving electronic data deliverables from the laboratory, data were electronically entered into the Oracle-based Louisiana Environmental Assessment Utility (L'EAU) database, maintained on a central LDEQ server by the Standards, Assessment and Nonpoint Source Section (SAN), Water Quality Assessment Division (WQAD), Office of Environmental Assessment (OEA). Data from LDHH and the contract laboratory were also entered into L'EAU by SAN staff. All ambient water quality data used for this assessment can be obtained by following directions found on the LDEQ web site at: http://www.deq.louisiana.gov/portal/Default.aspx?tabid=2421. In addition to water quality data collected by LDEQ, additional data and information are also being solicited from the public and will be considered during preparation of the final Integrated Report.

At the beginning of this assessment cycle, L'EAU and SAS programs were reviewed and updated as necessary to reflect changes in time frame, subsegments assessed, criteria, and assessment methods. A series of L'EAU data queries were run and the resulting data transferred to a series of SAS statistical programs. SAS programs are utilized to compare ambient numerical data to criteria for each water body subsegment and designated use. Louisiana Water Quality Standards define eight designated uses for surface waters: primary contact recreation (PCR), secondary contact recreation (SCR), fish and wildlife propagation (FWP), drinking water supply (DWS), shellfish propagation (SFP), agriculture (AGR), outstanding natural resource (ONR), and limited aquatic and wildlife use (LAW). Designated uses and criteria for each water body subsegment are listed in Louisiana ERC 33:IX.1123. Designated uses have a specific suite of ambient water quality parameters used to assess their support. Links between designated uses and water quality parameters can be found in Table 2. Data and information collected from within or immediately downstream of a water body subsegment, were used to evaluate each of the subsegments designated uses, using the decision process shown in Table 2. Where more than one parameter and criterion define a designated use, support for each use was defined by the designated uses poorest performing parameter (most severely impaired). Likewise, where data from more than one sample station were available, the most severely impaired station was used to make the assessment.

To illustrate this point, most water bodies have the designated use of fish and wildlife propagation (FWP). Fish and Wildlife Propagation is assessed, as noted in Table 2, using criteria for the ambient sampling parameters

dissolved oxygen, pH, temperature, chloride, sulfate, TDS, as well as several metals and organic compounds. In the case of subsegment LA030305_00, Contraband Bayou, only the FWP criterion for dissolved oxygen was not met based on requirements of Table 2. Therefore, only dissolved oxygen was reported as an impairment to FWP in the 2006 IR. Had turbidity or some other parameter also shown impairment that impairment would have been listed as well. In some cases two or more monitoring stations are present on the same water body subsegment. For example, subsegment LA030305_00, Contraband Bayou, has two ambient monitoring sites (0631 and 0824). Site 0824 was shown to be fully supporting the fecal coliform (bacteria) criterion for primary contact recreation (PCR) but site 0631 was shown to be not supporting the PCR fecal coliform criterion based on requirements of Table 2. Therefore, the entire subsegment was reported in the 2006 IR as impaired for PCR due to high fecal coliform densities.

Table 2.

Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana's *2006 Integrated Report*.

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially[2]	Not Supporting
Primary Contact Recreation (PCR) (Designated swimming months of May-October, only.)	Fecal coliform[1]	0-25% do not meet criteria	-	>25% do not meet criteria
	Temperature	0-30% do not meet criteria	>30-75% do not meet criteria	>75% do not meet criteria
Secondary Contact Recreation (SCR) (All months)	Fecal coliform[1]	0-25% do not meet criteria	-	>25 % do not meet criteria
Fish and Wildlife Propagation (FWP)	Dissolved oxygen[3]	0-10% do not meet minimum of 3.0 ppm and median > criteria of 5.0 ppm	-	>10% do not meet minimum of 3.0 ppm or median < criteria of 5.0 ppm
	Dissolved oxygen[4]	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria
	Temperature, pH, chloride, sulfate, TDS, turbidity	0-30% do not meet criteria	>30-75% do not meet criteria	>75% do not meet criteria
	Metals[5] and Toxics	< 2 exceedences of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters	-	2 or more exceedences of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters

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Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially[2]	Not Supporting
Drinking Water Source (DWS)	Color, Fecal coliform	0-30% do not meet criteria	>30-75% do not meet criteria	>75% do not meet criteria
	Metals and Toxics	< 2 exceedences of drinking water criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters		2 or more exceedences of drinking water criteria in the most recent consecutive 3-year period, or 1-year period for newly tested waters
Outstanding Natural Resource (ONR)	Turbidity	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria
Agriculture (AGR)	None	-	-	-
Oyster Production (SFP)	Fecal coliform[1]	Median fecal coliform $\leq$ 14 MPN/100 mL; and $\leq$ 10% of samples $\leq$ 43 MPN/100 mL	-	Median fecal coliform > 14 MPN/100 mL; and > 10% of samples > 43 MPN/100 mL
Limited Aquatic and Wildlife (LAW)	Dissolved oxygen[4]	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria

1. For most water bodies, criteria are as follows: PCR, 400 colonies/100 mL; SCR, 2,000 colonies/100 mL; DWS, 2,000 colonies/100 mL; SFP, 43 colonies/100 mL (see ERC 33:IX.1123).
2. While the assessment category of "Partially Supporting" is included in the SAS statistical assessment programming, any use support failures were recorded in ADB as "Not Supporting." This procedure was first adopted for the 2002 §305(b) cycle because "partially supported" uses receive the same TMDL treatment as "not supported" uses.
3. Water bodies with a D.O. criterion of 5.0 mg/L. This assessment method differs from U.S. EPA guidance.
4. Estuarine waters with a D.O. criterion of 4.0 mg/L and water bodies for which a special study has been conducted to establish site-specific criteria for D.O.
5. Marine metals criteria were used for all water bodies with an average salinity greater than or equal to 16.0 ppt. Freshwater metals criteria were used for all other water bodies.

Numerical data collected between 1 January 1998 and 23 September 2005 were compiled for each assessment. This represents a slight change from the normal five-year sampling period used in the past. Due to LDEQ's change to a four-year rotating basins monitoring program, LDEQ made the decision to extend the sampling period to allow for two full years of data, where available, for each basin assessed during a given assessment cycle. For many sampling sites, however, (e.g., new sites added under the rotating basins monitoring plan), only 6 to 12 months of data were available at reporting time. As basins are sampled for the second time in the rotation, it will become possible to use data from two monitoring rotations for each basin's assessment update. For most parameters and criteria, at least five samples were required for the assessment to be considered valid. Ambient data used for analysis depended on designated use(s) for each water body and the availability of numerical water quality criteria.

Following statistical determination of a water body's designated use support and what chemical parameters in that water body may be impaired, a determination was then made as to what Integrated Report Category (IRC) the suspected water body impairment combination (WIC) should be placed in. A WIC is simply one impairment affecting one water body subsegment. For example, low dissolved oxygen, an impairment on subsegment

LA030305_00, Contraband Bayou, is one WIC. In this case the WIC is an impairment to the designated use of FWP. In addition to this impairment, Contraband Bayou is also affected by the WIC of fecal coliform impairing the designated use of PCR. EPA guidance permits the placement of suspected WICs into one of seven IR categories. Integrated Report Categories, to which these WICs may be assigned, are described in Table 3.

A careful review of the IRC descriptions for 2006 led LDEQ to change WICs previously designated IRC 3 to IRC 2. For 2006 IRC 2 was used for water bodies in which some assessment information was available but not enough to be certain regarding a given suspected WIC. The resulting change from IRC 3 to IRC 2 is a change in nomenclature only and has no impact on water quality management aspects of a given water body.

Table 3.
Environmental Protection Agency Integrated Report categories used to categorize water body/pollutant combinations for Louisiana's 2006 Integrated Report.

IR Category (IRC)	IR Category Description
IRC 1	Specific Water body Impairment Combination (WIC) cited on a *previous* §303(d) list is now attaining all uses and standards.
IRC 2	Water body is meeting *some* uses and standards but there is insufficient data to determine if uses and standards *associated with the specific WIC* cited are being attained.
IRC 3	There is insufficient data to determine if uses and standards *associated with the specific WIC* cited are being attained.
IRC 4a	WIC exists but a TMDL has been completed for the *specific WIC* cited.
IRC 4b	WIC exists but control measures other than a TMDL are expected to result in attainment of designated uses *associated with the specific WIC* cited.
IRC 4c	WIC exists but a pollutant does not cause the *specific WIC* cited.
IRC 5	WIC exists for one or more uses, and a TMDL is required for the *specific W*IC cited. IRC 5 represents Louisiana's §303(d) list.

Determination of Suspected Sources of Impairment

In addition to use of numerical data, LDEQ regional staff members were asked for input regarding significant suspected sources of impairment, or whether impairment due solely to natural sources was occurring. It was anticipated that numerical data alone might suggest impairment for some Louisiana water bodies when in fact there was no impairment, or the impairment was due exclusively to natural causes. In all cases, regional staff familiar with the area would be able to suggest one or more suspected sources for a water body's impairment. Using the best professional judgment of regional staff provides valuable input regarding the quality of individual water bodies.

Data Management of Assessment Results

All resulting assessment information, including water body name, size, type, designated uses, use support, suspected causes, and suspected sources of impairment were entered into a database developed for the U.S. EPA by RTI. (Formerly known as Research Triangle Institute, RTI is an EPA contractor for computer technology.) States are being encouraged by EPA to use this Assessment Database (ADB) in order to provide more consistent reporting at a national level. LDEQ has been using ADB since 2002. For 2006, IR Categories for each WIC were included in the "User Flag" field of the "Cause" data entry screen. Additional information regarding each water body including TMDL due date, TMDL status, monitoring information, and federal Hydrologic Unit Code (HUC) can also be input to ADB. Due to time limitations during this reporting cycle, this information has not yet been consistently recorded in ADB for all water bodies; however, all required information for the IR and water quality assessment process has been included. LDEQ hopes to add the remainder of this ancillary information to the ADB system following completion of the 2006 IR in order to facilitate easier tracking.

2006 §303(d) List Development and Other IR Categorizations

The 2006 §303(d) list represents a compilation of four different sources of information.

1. The 2004 Integrated Report.
2. New data assessments for the Atchafalaya, Barataria, Calcasieu, Mississippi, Ouachita, and Terrebonne Basins, along with long-term trend water bodies, were accounted for.

3. All recent TMDL activities occurring during or after development of the 2004 §303(d) list was taken into account.
4. All water bodies under new or existing fish consumption or swimming advisories were noted.

In rectifying these various sources and assigning IR Categories to the suspected sources of impairment, EPA's current guidance on IR development was used to determine what water bodies were formally included on Louisiana's 2006 list (IRC 5). Using EPA's IR guidance, all suspected WICs identified in the 2006 IR were assigned to one of seven categories (Table 3).

It is important to note that removal of a water body from the §303(d) list (IRC 5), for any reason, does not remove water quality protections from that water body. *All* water bodies in Louisiana, listed or not listed, are subject to the same protections under the Clean Water Act and Louisiana's Environmental Quality Act. Permitted facilities are still subject to conditions of their permits. Unpermitted point source dischargers are still required to obtain a permit or face enforcement actions. Violators of permit conditions are still subject to enforcement action. And, contributors to nonpoint sources of pollution are still encouraged to follow best management practices as developed by LDEQ's Nonpoint Source Program and its many collaborators. Discharges to water bodies removed from the §303(d) list because TMDLs have been developed are still required to meet permit limits based on the TMDL that was developed for that water body.

EPA's IR guidance was used to categorize specific suspected WICs in order to narrow the focus on what impairments require development of a TMDL for each assessed water body subsegment. If necessary, suspected WICs placed in IRC 2 and 4b will be addressed with additional monitoring to determine if use impairment is occurring, or if the suspected impairment can be addressed by corrective actions other than development of a TMDL. In the case of known impairments, usually fish consumption or swimming advisories, to small water bodies lying within a larger regulatory subsegment, the smaller water body was also named in the 2006 IR. Impairments of this nature are water body-specific issues not directly related to the overall subsegment. These smaller water bodies not named as a regulatory subsegment were not assessed for any uses other than the specific advisory in question.

Use of IRC 1-4c by Louisiana is not meant to imply that a *water body subsegment* placed in these categories for specific WICs is explicitly *excluded* from IRC 5 (the list). To the contrary, a water body with one or more specific WICs assigned to an IRC of 1-4c will be included in IRC 5 as well, provided one or more WICs for that water body have been placed in IRC 5. Therefore, according to EPA IR guidance, water bodies with one or more WICs assigned to IRC 5 are *explicitly on the §303(d) list*. **However, these water bodies are only on the §303(d) list for WICs assigned by Louisiana specifically to IRC 5**. IR Categories 1-4c were used by Louisiana in its Integrated Report as a means to classify and account for WICs found on EPA's Consent Decree §303(d) list. These categories were also used to account for newly identified impairments, not assigned to IRC 5, that are caused by natural sources or for which control activities other than TMDLs are in place.

Overview of Significant Differences between Louisiana's 2004 and 2006 Integrated Reports

A summary of the numerical differences between the 2004 and 2006 Integrated Reports can be found in Table 4. Integrated Report Category 1 increased from 982 to 1057, indicating additional water bodies that were formerly impaired but are now fully supporting their designated uses. As was noted earlier, WICs formerly in IRC 3 were switched to IRC 2. This is a technical change only and does not affect management of these WICs in any way. The number of WICs in IRC 2 (formerly 3) decreased from 194 to 81 as a result of additional data becoming available resulting in changes to their support status.

IRC 4a declined slightly from 473 to 461 because water bodies with existing TMDLs (IRC 4a) are now fully supporting the criteria for which the TMDLs were developed. However, TMDLs for these water bodies remain in force even though the criteria are now supported. Water body impairments assigned to IRC 4b remained the same at 53. A total of 108 WICs were assigned to IRC 4c for the 2006 IR. Field surveys and review by regional staff indicated that the sources of these failures to meet criteria were not caused by a pollutant. In each of these cases the failure to meet criteria is believed to be caused by natural conditions with no anthropogenic input. As recommended by EPA, additional monitoring will be conducted to confirm that there continues to be no pollutant-caused impairment. In addition, LDEQ will conduct use attainability analyses (UAAs) on these water bodies in order to determine if more appropriate criteria can be established.

Finally, IRC 5, the §303(d) list, continued to decline from 419 WICs to 374. This was due either to additional TMDLs being completed or in some cases due to the water bodies now being fully supported. Due to the complexity of the IR assessment process, all changes cannot be summarized in this rationale.

Table 4.
Summary of differences between Louisiana's 2004 and 2006 Integrated Report category totals.

		IRC 1[1]	IRC 2	IRC 3[2]	IRC 4a[2]	IRC 4b[2]	IRC 4c	IRC 5[2] (§303(d) List)
Total number of water body/ impairment combinations in each IR Category	Final 2002 Integrated Report	849	0	155	95	60	0	443
	Final 2004 Integrated Report	982	0	194	473	53	0	419
	Draft 2006 Integrated Report	1057	81[3]	0[3]	461	53	108	374

1. All IRC 1, formerly suspected impairments, are in the IRC 1 Addendum, not in the IR itself. EPA's Assessment Database system (ADB) from which the IR is derived cannot track water body impairment combinations that have been delisted from earlier IR cycles.
2. Most suspected impairments listed in these categories are present in the IR. However, some listings from previous IR cycles had to be placed in the IR Addendum due to limitations of EPA's ADB system, since these impairments are not included in ADB.
3. WICs formerly assigned to IRC 3 have been switched to IRC 2 to more closely follow EPA guidance. This is a nomenclature change only and has no effect on water quality management activities for these water bodies.

Conclusion

Due to the extensive nature of documentation used to assess water quality in Louisiana, it was impossible to provide all the data or information used in preparation of this 2006 IR. Anyone interested in viewing this documentation, or anyone with questions regarding the 2006 Integrated Report is asked to contact Mr. Albert E. Hindrichs at:

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Literature Cited

Code of Federal Regulations. 2000. Water quality planning and management. 40 CFR, 130.7. Washington, D.C.

EPA Region 6. 1998. Evaluation of Bayou Lafourche wetlands restoration project: coastal wetlands planning, protection and restoration act project PBA-20, summary report September, 1998, preliminary draft. U.S. Environmental Protection Agency, Region 6.

EPA Region 6. 2002. Tensas River TMDLs for dissolved oxygen and nutrients: subsegment 081201 (May 28, 2002) http://www.epa.gov/earth1r6/6wq/ecopro/latmdl/tensasdo(f).pdf. Dallas, TX

Federal Water Pollution Control Act, as Amended (Clean Water Act). 1987. Water quality standards and implementation plans. 33 U.S.C. §1313 et seq. Washington, D.C.

Environmental Regulatory Code. 2006. Water quality. ERC 33:IX. et seq. Louisiana Department of Environmental Quality. Baton Rouge, LA.

Sierra Club v. Givens, 710 So.2d 249 (La. App. 1st Cir. 1997), writ denied, 705 So.2d 1106 (La. 1998) http://www.deq.state.la.us/technology/tmdl/index.htm.